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Herb Autenrieth, 91, the University's oldest employee, says farewell to guard duty at the Tyson Research Center after 23 years of service.

Letting his guard down

At 91, oldest employee says goodbye to gatekeeping duty

Herb Autenrieth, a gatekeeper at Tyson Research Center for 23 years, quit his job April 13. Despite his 91 years of age, Washington University's oldest employee is quick to point out that he's "quitting," not retiring.

A knee injury from years ago bothers him sometimes, but in general, Autenrieth doesn't make mention of failing health or complain that he's "too old to work." Rather, he's leaving his job to travel and spend more time with his family. He and his wife of 70 years, Nonie, have three children, 10 grandchildren and 11 great-grandchildren.

On April 12, friends, family and co-workers threw a party at Tyson for Autenrieth. Autenrieth sat with his feet propped up on a desk in the Tyson gatehouse, laughing and swapping stories with fellow gatekeeper Riley Pemberton. Meanwhile, their boss, Richard W. Coles, Ph.D., adjunct professor of biology and director of Tyson, kept busy performing Autenrieth's usual duties of checking in visitors, handling deliveries and selling birdseed.

Checking visitors in and out is serious business at Tyson. The research center must be protected from intruders or well-intentioned visitors who might accidentally upset the habitat and ecological investigations in the 2,000-acre tract. Only those with official Tyson ID cards, keys or letters of admission are free to enter Tyson center. Faculty members from Washington University, St. Louis University, and the University of Missouri-St. Louis frequently visit Tyson to conduct studies, and are issued ID cards. Special visitors and student groups can arrange an appointment or guided tours.

From the very beginning, Autenrieth took his role as guard to heart. He and Coles get a good laugh as they tell the story about how Autenrieth refused to let in Tyson's former director of construction and maintenance, Raymond Flint. "He was hired by Ray Flint," Coles began. Autenrieth continued the story, "Well, they told me not to let no one in. Raymond Flint drove up to the gate and I wouldn't let him in. You see, he had hired me over the phone. My boss at the time came running over the hill. He said, 'Open the gate, Herb, that's Mr. Flint.' In a couple of hours, my boss came back. You know what he said? He said, 'Herb, you're a damn good gateman.'"

That incident happened before the arrival of Coles. Back in 1968, Autenrieth's job was quite a bit different. At times, there would only be three visitors during the entire month. "When I first got here, there was no traffic at all. I'd come in, unlock the gate, sleep. After Dr. Coles

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***Inside:* MEDICAL RECORD**

Making a comeback

Moon's abundant resources could supply world with energy for thousands of years

An old friend is still waiting for another visit.

The moon, seemingly out of favor with the U.S. space program since the last of the Apollo missions in 1972, will be a cornerstone of the nation's space plans for the coming decades.

A key leader in the push to return to the moon is geochemist Larry A. Haskin, Ph.D., a professor of earth and planetary sciences at Washington University and former chief of the planetary and earth sciences division of NASA's Johnson Space Center in Houston.

Haskin, a 21-year veteran of studying the chemistry of lunar soils and rocks, says that the moon is vital to the country's space plans because of its abundance of materials for life support, fuel and construction, and because of its handy location in the solar system. Worldwide energy concerns, coupled with fears of global warming, provide a further incentive to return: The moon contains mineable helium-3, a helium isotope that can be used as a "clean" fuel in the fusion reactors of the future. The isotope is rare on Earth, but lunar soils contain enough of it to supply the world with energy for thousands of years.

"Looking well into the future, you can see that the moon will provide us with materials for practical use and also give us the experience needed to learn how to live and work effectively on more distant bodies in the solar system," says Haskin. "For now, it is the logical place for research and development of techniques for mining, manufacturing and simply living in space."

While a return to the moon is no misbegotten goal, Haskin says that notions about the planet have been misconceived. When it was first discovered that the minerals making up lunar volcanic rocks showed no signs of exposure to water, many scientists and space buffs wrote off the moon as a practical place for resources or settlement.

In *Proceedings of the Second Conference on Lunar Bases and Space Activities of the Twenty-first Century,* a book to be published this year by Univelt Inc., Haskin states that the moon has been underrated as a source of hydrogen, nitrogen, carbon and other elements essential to support life, provide fuel for rockets and furnish materials for filling stations, electric companies, lumber yards and indoor farms — in short, to provide for a 21st-century settlement. The moon, he says, largely has been ignored in favor of "unproven resources" such as near-Earth and martian asteroids.

Although the moon apparently formed in an environment depleted in carbon, nitrogen, hydrogen and helium, those elements were added to the soils as atoms from the solar wind, a plasma of particles accelerated outward from the sun. So, the chemical constituents of water and other elements are abundant on the moon; they just don't occur in forms we are used to using on Earth.

Lunar lunch

In his chapter, "Water and Cheese from the Lunar Desert: Abundances and Accessibility of H,C, and N on the Moon," Haskin writes: "Each cubic meter of typical lunar soil contains the

Continued on p. 2

Roloff is named executive vice chancellor

Richard A. Roloff, president of Plaza Development Co., will become the executive vice chancellor at Washington University on May 1, according to Chancellor William H. Danforth. A Washington University trustee since 1985, Roloff currently heads the company responsible for building the recently completed Ritz-Carlton Hotel in Clayton, Mo.

Roloff's responsibilities will include oversight of real estate, facilities, and campus business and service areas. The position of executive vice chancellor is newly created for Roloff.

"Having Dick Roloff join the administrative team at Washington University is a wonderful opportunity for us to benefit from his experience in business management, real estate, and planning," Danforth said. "As a graduate, a lifelong volunteer, and now as a trustee, Dick has come to know us extremely well, and can bring that knowledge to bear on how to manage our assets, especially our physical assets, so as to prepare ourselves for the next century."

A 1951 graduate of the Washington University School of Engineering, Roloff has been a leader in St. Louis business and development. Before becoming president of Plaza Development Co. he was president of Capitol Land Co. In addition to the Ritz-Carlton, he has been instrumental in the development of Plaza Frontenac and worked with the Gateway Mall planning effort. A few weeks ago he was named business person of the year by the Clayton Chamber of Commerce.

As a volunteer, Roloff has been active in the revitalization of St. Louis' Central West End through his support of and leadership in the Washington University Medical Center Redevelopment Corp. As a Washington University trustee, he serves on the executive committee, as chair of the buildings and grounds committee, and as a member of the real estate committee.

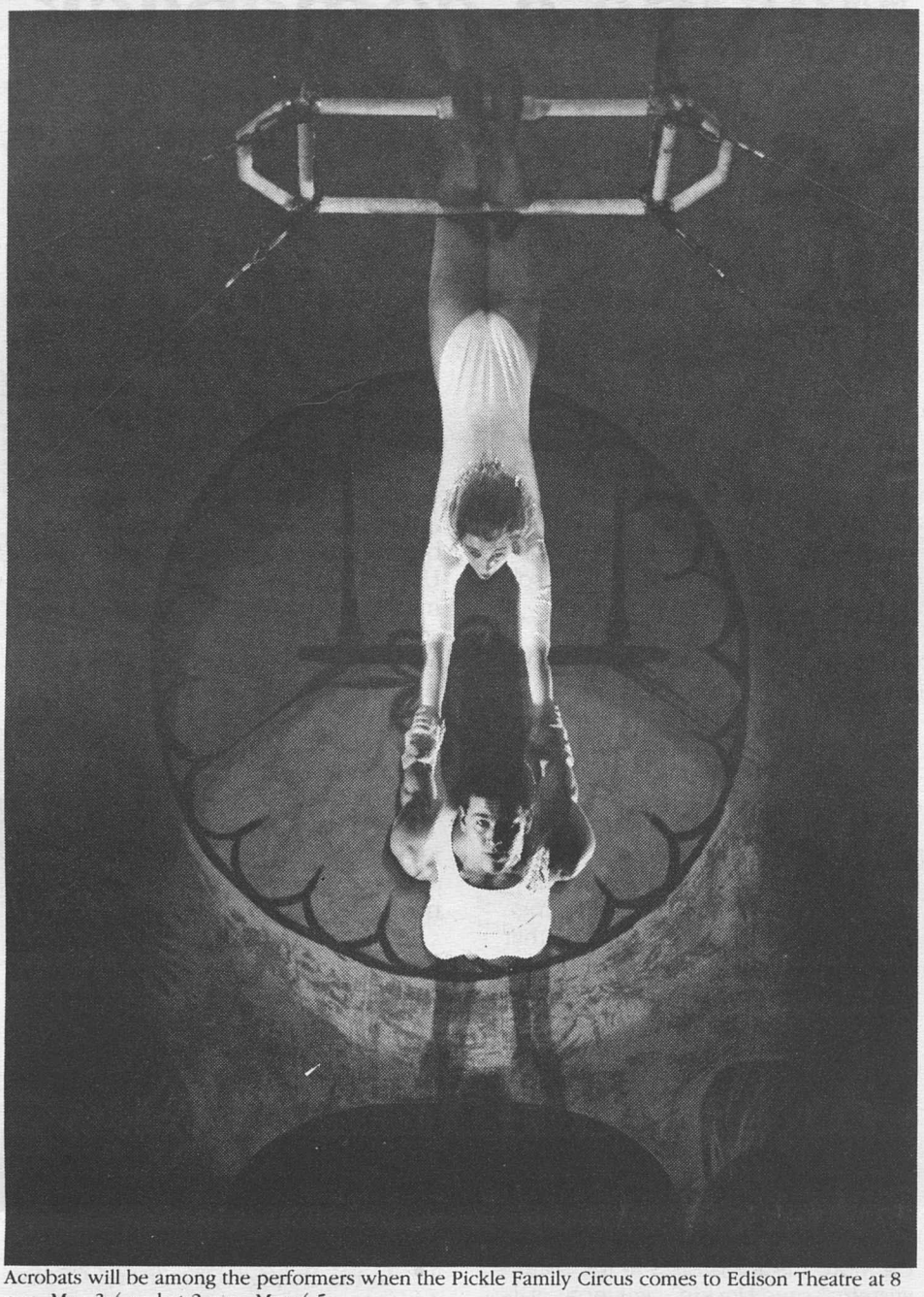
In 1976 Roloff received the University's School of Engineering Alumni Achievement Award. He has served as captain of the major gifts committee of that school. He is a member of the National Council for the School of Engineering, was chair of his 40th class reunion, and sponsors the Don A. Fisher Memorial Scholarship in engineering.

Richard A. Roloff

"Not only is he a very successful businessman, he is, more than any other individual, responsible for the success of our medical center redevelopment corporation effort," Danforth noted.

As a student at Washington University, Roloff was a member of the student honorary Thurtene, Omicron Delta Kappa, and Phi Delta Theta fraternity. Following graduation he served two years in the U.S. Coast Guard and then entered the land development business.

He is married to Peggy Rodgers, a 1952 Washington University graduate of the College of Arts and Sciences.



Acrobats will be among the performers when the Pickle Family Circus comes to Edison Theatre at 8 p.m. May 3-4 and at 2 p.m. May 4-5.

Pickle Family Circus comes to campus

Here's how it usually works: The kids plead to go to the circus, the parents give in, and everybody pretends that the parents are sitting there amidst children, Cracker Jacks and cotton candy just to indulge the kids. In reality, the parents have at least as much fun as the kids do — maybe even more.

The Pickle family doesn't believe that circus fun is just for chronological children. When they perform in the Edison Theatre "OVATIONS!" series finale at 8 p.m. May 3 and 4 and at 2 p.m. May 4 and 5, they're aiming to please kids of all ages.

Like the intimate one-ring European circuses that form their heritage, the Pickle Family Circus presents a swift succession of jugglers, wire-walkers and acrobats, all in a context of inspired clowning. The circus ends with a vaudeville-style piece set in the aptly named "Cafe Chaotique."

Tickets for the Pickle Family Circus are $18 for the general public; $14 for senior citizens and Washington faculty and staff; and $9 for students.

For more information, call 889-6543.

Performing arts production is sold out

The Performing Arts Department will present three soldout performances of Alan Ayckbourne's "Woman in Mind," described by the London Guardian as "a savage tragi-comedy." The performances will be held at 8 p.m. April 26 and 27 and at 2 p.m. April 28 in the Mallinckrodt Center Drama Studio.

The eight-person cast of "Woman in Mind" is directed by Christopher E. Sanders, who received a bachelor's degree from the University in 1989 and is pursuing a master's degree in drama from Washington. Sophomore Sonya Robbins, in her first departmental role at the University, plays the lead role. Other cast members include freshmen Ed Jackson and Michael Holmes, sophomore Nate Fristoe, junior Nikola Wilensky, seniors Robin Margolis and Louis Goldman, and alumnus Ken Gurney.

For more information, call 889-6543.

Center hosts Islamic literature workshop

The Center for the Study of Islamic Societies and Civilizations will host an international workshop on "New Approaches in the Study of Islamic Literatures" May 3-4. The workshop is part of the center's 1990-91 Rockefeller Residency Fellowship Program.

The workshop is designed as a forum to facilitate the exchange of ideas among scholars actively engaged in the field of Islamic literary history and criticism, says Ahmet T. Karamustafa, Ph.D., director of the 1990-91 Rockefeller Residency Program and assistant professor of Islamic thought and Turkish literature.

The workshop will feature eight principal speakers from Europe and the United States who work in Arabic, Persian and Turkish literary traditions, as well as Washington University faculty.

For more information about the workshop, which will be held in the Alumni House, 6510 Wallace Circle, call 726-4446 or 889-5166.

Moon's resources — *continued from p. 1*

chemical equivalent of lunch for two — two large cheese sandwiches, two 12-ounce sodas with sugar and two plums, with substantial nitrogen and carbon left over. Of course, there are several steps of chemical extraction and synthesis to get from lunar soil to lunch, but the technology for extraction is straightforward and biological synthesis can do the rest."

Hydrogen, carbon and nitrogen can be extracted from the soil by heating it to about 700 degrees Celsius. The sun can furnish the energy; a few megawatts of power would be sufficient to produce hydrogen at a rate of 40 metric tons per year. Astronauts and robots would get the job done.

"The problem of accessibility of hydrogen, carbon and nitrogen for use in near-Earth space is an economical one," Haskin says. "When we want to use large quantities of these elements in near-Earth space, will it be cheaper to obtain them by heating lunar soil, or to provide them from the Earth or other sources? If we end up mining lunar soil for helium-3, those elements will be a voluminous by-product, giving us almost embarrassingly large quantities of materials that are perceived as rare on the moon. Of course, commercial fusion still seems a long way down the road, but we should be looking ahead. Certainly, the Japanese, Europeans and the Soviet Union are considering uses for the moon, and the Japanese have begun sending satellites there and are exploring architectures for a lunar base."

Nuclear fusion

Nuclear high-temperature fusion — not to be confused with "cold" fusion that gained notoriety in 1989 — is a scientifically established process that releases large amounts of energy. Development of a viable fusion reactor has captured the fancy of scientists worldwide, and the United States and other countries support research toward that goal. The United States, for instance, has funded fusion research at approximately $300 million per year in recent years. Fusion is the process that produces the sun's energy; it occurs when light atoms such as hydrogen are fused together into larger elements at ultra-high temperatures of millions of degrees Celsius. In nuclear fission, the process long in vogue to make electricity, very large atoms such as uranium are split and part of the energy holding the uranium nucleus together is released.

To make fusion energy a reality, scientists and engineers must achieve and then surpass an energy break-even point where the amount of energy produced in a reaction experiment exceeds the amount put in. Energy in excess of the break-even amount can be used to make electricity. Recent experiments have brought scientists near the break-even point, spurring more hope for commercial fusion in the next few decades.

For practical fusion reactors, helium-3 has advantages and disadvantages. Ignition of helium-3-deuterium fusion requires a higher temperature and a more demanding reactor physics program than is required for tritium-deuterium fusion. So, it is harder to achieve, although it has been demonstrated in experimental reactors. Deuterium is the second most abundant hydrogen isotope, the one concentrated to make heavy water. Tritium is a radioactive form of hydrogen that now is produced in a nuclear fission reactor, and will be produced in a fusion reactor in the materials surrounding the plasma — the burning fuel in the reactor. Tritium decays with a half-life of about 12 years, producing helium-3 in the process. So, helium-3 can be made on Earth by first producing tritium, then waiting.

Radioactive waste?

But fission reactors produce long-lived fission products, the major form of radioactive waste. Using or storing tritium requires handling a radioactive material. Furthermore, when tritium and deuterium fuse, the reaction gives off a neutron, which causes extensive structural damage to reactor walls and produces even more radioactive material. Helium-3, neither radioactive nor harmful to the environment, reacts with deuterium and yields a proton, which the reactor stops easily. Less than one percent of the energy released from the deuterium-helium-3 reaction comes out in the form of neutrons, which can produce some radioactivity. The mining of helium-3 from the moon instead of producing it on Earth, then, eliminates the need for a fission reactor.

According to Gerald Kulcinski, Ph.D., director of the Fusion Technology Institute at the University of Wisconsin, Madison, the presence of helium-3 on the moon is the chief economic reason to return to it.

"The moon is valuable for scientific and exploratory reasons, as well as strategic purposes," says Kulcinski, who directs the largest group of fusion researchers on a university campus in the country. "As a fuel station and stopping-off point for the space station, or Mars, Saturn and Jupiter, the moon could become the O'Hare Airport of the Sky. As a place to store energy supplies, it could become the Hudson Bay Co. of outer space. Much of this potential hinges on the development and use of helium-3 for fusion."

"It is gratifying to see that President Bush has said that we will return to the moon to stay."

— Larry A. Haskin

A major impediment to establishing a base on the moon has long been the difficulty in maintaining life-support systems. But, says Kulcinski, mining a ton of helium-3 would provide enough by-products to support tens of thousands of people on the moon. The process that produces a ton of He-3 also produces 500 tons of nitrogen, 3,100 tons of helium, 3,300 tons of water, 1,500 tons of natural gas, 3,600 tons of carbon-oxygen compounds and 6,100 tons of hydrogen.

The United States will be taking a serious political and economic risk by leaving the moon to others to explore, says Haskin.

"There's no more convenient place to get experience living and working on another planet, and we can get back and forth to it in just a few days. We can even monitor the Earth from the side of the moon that always faces us. It is gratifying to see that President Bush has said that we will return to the moon to stay. We hope the drive to land humans on Mars will not overshadow the challenges of learning to live on the moon and using its resources."

—Tony Fitzpatrick

NOTABLES

John R. Bowen, Ph.D., assistant professor of anthropology, has received an award from the Spencer Foundation to study the transmission of modernist Muslim knowledge in Indonesia. His book, *Sumatran Politics and Poetics*, recently was published by Yale University Press.

Sol L. Garfield, Ph.D., professor emeritus of psychology, presented a colloquium lecture to the Department of Psychology at the University of South Florida in Tampa. He also gave a grand rounds lecture at the Institute of Psychiatry of the Medical University of South Carolina in Charleston.

Lucian Krukowski, Ph.D., professor of philosophy, presented a paper titled "Schopenhauer and the Aesthetics of Modernism" at the Schopenhauer Society session of the American Philosophical Association meeting in San Francisco.

Heikki Seppa, professor of art and master metalsmith, conducted a workshop and public lecture on the shell structures technique, which deals with compound curvature development on sheet metal structures. The three-day event was sponsored by the Philadelphia Society of Goldsmiths and the University of the Arts in Philadelphia, Pa.

Michael Sherraden, Ph.D., associate professor of social work, gave an invited presentation on youth social service at a conference titled "Europe Plus Moscow: Experience and Perspectives on State Youth Policy" in Moscow. He also delivered an invited presentation on social work in the United States to the Ministry of Social Welfare of the Russian Republic. He gave an invited talk titled "Assets and the Poor: A New Direction in Welfare Policy" at the annual meeting of the National Association of Social Workers in Boston. His book titled *Assets and the Poor: A New American Welfare Policy* was released last month by M.E. Sharpe.

Elzbieta Sklodowska, Ph.D., associate professor of Spanish, presented two papers, both in Spanish, at recent conventions. Sklodowska gave "Genre Memory in Spanish American Testimonial Narrative" at the 20th-century Literature conference in Louisville, Ky., and "New Journalism of Walsh and Poniatowska: Veridiction and Verifiction" at the Northeast Modern Language Association (NEMLA) conference in Hartford, Conn. Sklodowska also was chosen as the winner of the NEMLA Foreign Language Award of 1991 for the manuscript "Spanish America Testimonial Narrative: History, Theory, Poetics," also in Spanish, to be published by Peter Lang.

J. Gershon Spector, M.D., professor of otolaryngology-head and neck surgery, was the visiting professor at the Mexican Society of Otolaryngology-Head and Neck Surgery annual meeting in Mexico City, where he presented papers on "Eye Deviation in Periorbital and Sinus Tumors," Treatment of Malignant Exophthalmos" and "Management of Malignancies of the Paranasal Sinuses and Deep Structures of the Face." He participated in a multidisciplinary panel discussion on therapies, complications, results, and rehabilitation of sinus tumors. He also was the invited guest of honor of the royal Australasian College of Surgeons to the Australian Society of Otolaryngology-Head and Neck Surgery Annual General and Scientific meeting held in Hobart, Tasmania. He presented papers on "Diagnosis and Management of Angiofibromata," "Diagnosis and Management of Glomus Tumors," "Management of Temporal Bone Carcinomas" and "Management of the Paralyzed Face."

Paul S.G. Stein, Ph.D., professor of biology, was an invited speaker at the International Joint Conference on Neural Networks held in San Diego. He presented a talk on "Intrinsic Capabilities of Neural Networks in the Turtle Spinal Cord: Selection and Generation of Motor Patterns" during the Sensorimotor Control Systems Symposium. He also was an invited speaker for the seminar on "Rhythm in Nature and Culture," sponsored by the Commonwealth Center for Literary and Cultural Change at the University of Virginia. His talk was on "The Biology of Rhythmic Limb Movements." In addition, he delivered a speech on "Processing of Cutaneous Information in the Spinal Cord: Scratch Reflex in the Turtle" at the Biodynamics Institute at the University of Virginia.

Alan Templeton, Ph.D., professor of biology, recently taught in a course on Studbook Management for Endangered Species. The course, which was held at the St. Louis Zoo, was sponsored by the American Association of Zoological Parks and Aquaria. He also served on an internal panel that evaluates research in systematics for the Swedish Natural Science Research Council. Within the department, he has served as chair of the search committee for a new appointment in population and evolutionary biology.

Richard A. Watson, Ph.D., professor of philosophy, published a book titled *The Philosopher's Joke: Essays in Form and Content* (Buffalo: Prometheus Books, 1991).

Have you done something noteworthy?

Have you: Presented a paper? Won an award? Been named to a committee or elected an officer of a professional organization? The Washington University Record will help spread the good news. Contributions regarding faculty and staff scholarly or professional activities are gladly accepted and encouraged. Send a brief note with your full name, highest-earned degree, current title and department along with a description of your noteworthy activity to Notables, Campus Box 1070, or by electronic mail to p72245SS at WUVMC. Please include a phone number.

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Editor: Susan Killenberg, 889-5254, Campus Box 1070; P72245SS at WUVMC
Assistant editors: Deborah Parker, 889-5235, Campus Box 1070; P72245DP at WUVMC; Carolyn Sanford, 889-5293, Campus Box 1070; P72245CS at WUVMC
Editor, Medical Record: Joni Westerhouse, 362-8257, Medical School Campus Box 8065; C72245JW at WUVMD
Contributing writers: Debra Bernardo, Joyce Bono, Kleila Carlson, Gerry Everding, Tony Fitzpatrick, Fran Hooker and Virginia Perkins
Photographers: Joe Angeles, Tom Heine, David Kilper and Herb Weitman
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GE Foundation awards grants to address shortage of female and minority faculty

Sally A. Goldman, Ph.D., assistant professor of computer science, has received a $25,000 junior faculty grant from the GE Foundation.

The award is part of the $15 million "Faculty for the Future" program established by the GE Foundation to address the critical shortage of female and minority professors in American colleges and universities. Washington University is one of 11 institutions the GE Foundation selected to receive junior faculty grants for faculty development.

"There is a crucial need to attract more women and underrepresented minorities to academic careers in engineering, the physical sciences and business," said Clifford V. Smith Jr., GE Foundation president. "For example, of the 5,000 engineering doctorates awarded in 1989, only 70 went to underrepresented minorities, and 440 to women. These numbers show that the problem is very real and the need for this program very great."

In addition to the Junior Faculty Grants, the GE Foundation awarded 50 fellowships totaling $1.55 million for universities to award to first-year graduate students for full tuition, fees and $12,000 stipends. Amy Brisben, a recent graduate of Washington University, received a GE Foundation fellowship to Johns Hopkins University, where she is studying biomedical engineering. Washington University received an unrestricted grant of $5,000 for selecting Brisben as a GE Fellow.

"We are pleased that the GE Foundation has selected two of our people for these outstanding programs," said Chancellor William H. Danforth. "This kind of concern and understanding of the need for better representation of women and minorities in the sciences will play a large role in improving the situation."

Goldman will use the money to support a doctoral graduate student in her special field of interest, computational learning theory, a developing field of computer science that employs the use of mathematics to explore the theory behind machine learning. Building machines that learn from experience is an important goal of artificial intelligence, which strives to design machines that behave intelligently. In contrast to standard machine learning research, computational learning theory tries to define formal mathematical models of machine learning that enable performance analysis of learning algorithms. The insight gained from this work is expected to contribute to applications of machine learning.

A St. Louis native, Goldman joined the Washington University faculty in August 1990, after receiving her doctorate in electrical engineering and computer science from the Massachusetts Institute of Technology (MIT). She received a master's in the same field in 1987 from MIT and a bachelor's with honors in computer science from Brown University in 1984. At MIT, Goldman was a research assistant in machine learning and teaching assistant for an algorithms course. In the summers of 1982 through 1984, she worked on the research staff of the Central Institute for the Deaf.

Oldest employee — *continued from p. 1*

came in here, he got it started," Autenrieth said.

Today, between 30-35,000 visitors pass through the gates of Tyson in a year, more than 2,500 in a month. "They're (the gatekeepers) the first person someone sees at the gate, so they're a greeter. But it goes beyond that, they're also security guards," said Becky Palmer, secretary to Coles.

Palmer said Autenrieth's personality was the perfect mix for the job. He can be gruff when he needs to be, but he's also a joke-teller and general hobnobber, she said. "He's full of a lot of stories of before and what he's done since he's been here," Palmer said. "He's a fun person to be around. I'm sorry he's leaving."

Coles agreed that Autenrieth will be missed. "The busloads of students that visit love the 'grandpa-type guy.' He's an outgoing person for our visitors, but he's also aware of the need to filter visitors. On a nice day, people think this is an open-to-the-public facility. Herb has a way of saying, 'You're not in the right place,'" Coles said. "Frankly, as a supervisor, it's nice to have someone around whose been through it all. With his experience, he knows what's a problem and what's not. It's awfully nice to have a sounding board. He's a good fit."

All three gatekeepers at Tyson are past the usual retirement age. Pemberton is 88. "The third person is Ralph Cook. He's only 71," Coles said. The job with its 10-days on, 20-days off schedule allows flexibility, while still providing the men a chance to socialize and a sense of contribution. When the gatekeepers aren't tending to the gate, they're taking weather readings, selling merchandise, and keeping the fire going in the gatehouse's potbellied stove.

Working as a gatekeeper was a career switch for Autenrieth who worked at Chesterfield (Mo.) Farmers Elevator and Supply Company for 43 years. After quitting the grain business, Autenrieth bought a farm by Babler Park in West County, Mo. He raised hogs and cows until 1969. He sold the farm when he took the job at Tyson.

Coles said now that Autenrieth's retired, he hopes to see him visit regularly ... but only on one condition. He must show his ID card. "Herb never needed an ID card before," Coles said, laughing. "We gave him one when he retired. Whereas before he was a 'filterer,' now he's a 'filteree'."

— Deborah Parker

Pronunciation lessons are offered

International teaching faculty who want to improve their pronunciation skills may take advantage of a new free service offered by the International Office's English as a Second Language (ESL) Program.

Rosa Schuette, assistant director of the program, says diagnostic sessions will be offered to the faculty to assess weaknesses in English pronunciation. Optional follow-up sessions are available.

For more information, call Schuette at 889-5910.

MEDICAL RECORD

Alcoholics inherit biological difference

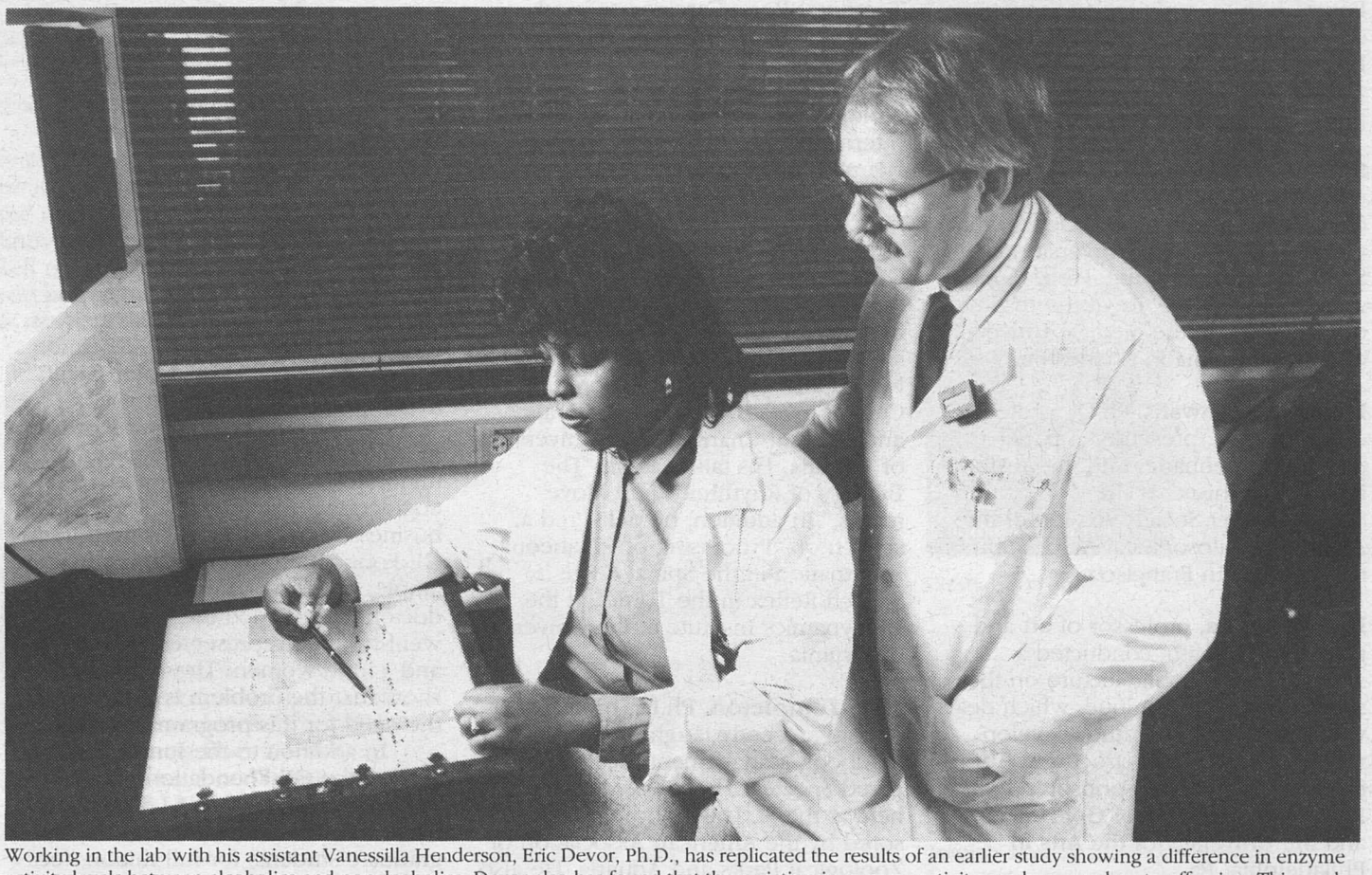
Because the disease is sporadic and often marked by a patient's denial of the problem, alcoholism is difficult to diagnose until dangerous, even life-threatening, complications have set in, confounding treatment. That's one reason why medical scientists have looked so assiduously for a marker — an easy-to-see but reliable signal — that is inherited along with the predisposition to alcoholism.

In research done recently at the School of Medicine, such a flag finally may have been confirmed. Experiments in the laboratory of Eric J. Devor, Ph.D., have replicated the results of an earlier study that showed a consistently lower level of activity for a particular enzyme in the systems of alcoholics than in nonalcoholics. What's more — and potentially more important to future research — Devor has demonstrated that the reduced enzyme activity is highly heritable and probably the product of a single gene.

"Our results show a constitutional difference between alcoholics and nonalcoholics," says Devor, an assistant professor of genetics in psychiatry. "We've found that a significant biological indicator of alcoholism is inherited."

Much remains to be done, but at the culmination of the research lies a blood test capable of revealing an individual's potential for at least one type of alcoholism — before he ever takes a drink rather than after he ends up in the emergency room. The concept of early diagnosis leads directly to the possibility of prevention and the saving of untold lives. And when gene therapy becomes reality in the more distant future, physicians will have at hand the location of one of the genes responsible for alcoholism.

More than 10 million Americans suffer from alcoholism, according to current estimates, making the disease the nation's most serious drug problem. It is the country's fourth leading cause of death.



Working in the lab with his assistant Vanessilla Henderson, Eric Devor, Ph.D., has replicated the results of an earlier study showing a difference in enzyme activity levels between alcoholics and nonalcoholics. Devor also has found that the variation in enzyme activity can be passed on to offspring. This work ultimately could lead to a blood test for determing a person's susceptibility to alcoholism.

A single, powerful gene

For 50 years, researchers have sought a diagnostic marker for alcoholism, looking for a recognizable genetic trait that is inherited along with the disease. For longer than that, scientists have recognized that in many cases, a susceptibility to alcoholism is genetically transmitted from parents to children. Unfortunately, most attempts to locate a reliable trait that is consistently inherited along with alcoholism have never been replicated, Devor says. Differences in EEG patterns between alcoholics and nonalcoholics, hormone dissimilarities and a dozen reported enzyme variations all have been proposed, only to fade when studies could not be reproduced.

In 1988, Boris Tabakoff, M.D., of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), reported results from his lab that showed a reduced level of activity for the enzyme adenylate cyclase in alcoholic subjects over controls. Adenylate cyclase had long been on a list of possible markers because it works to cross cell membranes and stimulate cells to do their jobs, especially in the brain and the liver, two of alcohol's effective sites. It is also a common enzyme found not just in man but in many mammals, indicating that it has an essential function retained by evolution.

In work to be published this spring in the proceedings of the 5th Congress of the International Society for Biomedical Research on Alcoholism, Devor replicated Tabakoff's early results in a separate group of alcoholics and their families from Washington University's experimental population. His data went on to show the same reduced level of activity for adenylate cyclase in the unaffected relatives of alcoholics. That finding points to genetic control over the enzyme's activity that is inherited along with alcoholism. And Devor's complex segregation analysis of the pattern of inheritance in the 115 individuals in the study revealed that one major gene was the force behind the variation in the enzyme's activity levels.

Tabakoff, a collaborator on Devor's research and the scientific director at NIAAA, explains: "The phenomenon now has been shown to be quite real. Devor has demonstrated the biological difference to be truly heritable and the product not of many genes each having a small effect, but of a single powerful one. Now, we will try to locate that gene." Tabakoff adds, "Work done primarily at Washington University shows that alcoholism is not one simple disease, but a complex group of types. This biological marker probably does not apply to the whole population, but to a subgroup. Using this and other markers yet to be developed, we hope to be able to classify alcoholism as to specific type and one day devise a precise treatment to fit the illness, as we do with other diseases."

A foothold on the ladder

Precisely what the relationship between alcoholism and adenylate cyclase activity is, the investigators don't yet know. Devor says the enzyme is not actively involved in the metabolism of alcohol. "But it doesn't have to be in the metabolic pathway of alcohol to be a possible cause of alcoholism," comments P. Michael Conneally, Ph.D., distinguished professor of medical genetics and neurology at Indiana University School of Medicine.

Conneally calls the research "very helpful in the big effort to map the genes responsible for alcoholism." But, he adds, work remains to be done. "It would be more informative if the study were qualitative, not quantitative. They (the researchers) talk about enzyme activity, not about different forms of a gene in alcoholics and nonalcoholics. There may be just one, very important, gene involved here, as Devor's analysis suggests, but we have to find it to predict the risks for an individual. This is a major hint for where to look."

In fact, Devor has begun a search for the gene responsible for the variation in enzyme activity level as the next step in his research. Adenylate cyclase is one element in a complicated cascade of signals, together called the "second messenger pathway," that prompts cells to do their work, Devor explains. To measure the enzyme's activity in the signalling pathway, the researchers added a known amount of stimulant to a known quantity of blood platelets (the cells), then measured the output by quantifying the step in the cascade that follows adenylate cyclase. The major gene effect was found only when the adenylate cyclase activity was chemically stimulated. In baseline measurements, there was no significant difference.

Each of the proteins at work in adenylate cyclase's signalling action is a product of a single gene, and for one of four likely candidates, Devor expects to find a fundamental genetic difference between alcoholics and non-alcoholics. He is locating and cloning those four genes, "taking apart the biological systems one at a time," as he puts it.

Family patterns

Work is also proceeding on the research's other front: investigating adenylate cyclase activity in families relative to their alcoholism. On Devor's chart rating the level of enzyme activity, families in which alcoholism was present clustered well beneath control families, even for those individuals who had never had a drink and for alcoholics who had been abstinent for four years. Still to come, however, is research that concentrates on the activity level of andenylate cyclase in families with no history of alcoholism. Strict scientific method requires studies that begin with nonalcoholic families and show a high relative level of activity, "before we can call this a direct measure of susceptibility to alcoholism," Devor says.

"That won't be as easy as it might sound," he adds, pointing out that perhaps five percent of the population suffers from alcoholism. By the time a kinship study examines all first-generation relatives, the likelihood of a perfectly "clean" profile by strict diagnostic standards is small.

Also to come are studies designed to link this biological marker to the type or types of alcoholism in which it plays a role. Early studies did not consider alcoholics by types, of which two are known and more are suspected.

Much of the work classifying alcoholism into types also has been done by Washington University researchers, most notably C. Robert Cloninger, M.D. Cloninger's classic studies of alcoholism in Swedish families established the role of genes and their modes of inheritance. That work revealed two types of alcoholism. Type 1, the more common, is characterized by drinking beginning in the second or third decade of life and little antisocial behavior. Both genetic and environmental factors are involved. Type 2 alcoholism is associated with social problems and is displayed only by males. Its heritability is much higher, regardless of environmental influences. More types may be identified, with greater or lesser genetic components.

Nonetheless, using only adenylate cyclase activity levels as an indicator, the research accurately predicted the presence of alcoholism in families almost three-fourths of the time. "Not all alcoholism will be related to adenylate cyclase activity; not all alcoholism even has a genetic component. So we're not talking about solving the problem completely," Devor acknowledges. The sophisticated enzyme analysis of the blood required to assess adenylate cyclase activity is not yet feasible on a population-wide, screening basis.

But the promise of a reliable tool for the early diagnosis of at least some types of alcoholism is finally real. And, Devor says, the future is now. He anticipates a practical application of his work in a matter of years, not decades. Such a direct measure of susceptibility to alcoholism, sought for so long, will cut the horrible costs extracted by western civilization's biggest drug problem. *Steve Kobler*

AIDS satellite facility opens at Regional

The AIDS Clinical Trials Unit (ACTU) at the School of Medicine has opened a satellite facility at St. Louis Regional Medical Center.

The facility, located in Regional Medical Center's Infectious Disease Clinic at 5535 Delmar, is open from 8 a.m. to 12:30 p.m. Mondays and Thursdays with plans to expand hours to 8 a.m. to 4 p.m. Mondays, Wednesdays and Thursdays.

The satellite facility is open to anyone who qualifies for care at Regional Medical Center. The purpose of the facility is to make it easier for underrepresented populations, in particular the medically indigent, blacks and IV drug users, to participate in AIDS-related drug studies while receiving primary care for HIV infection at the Regional clinic.

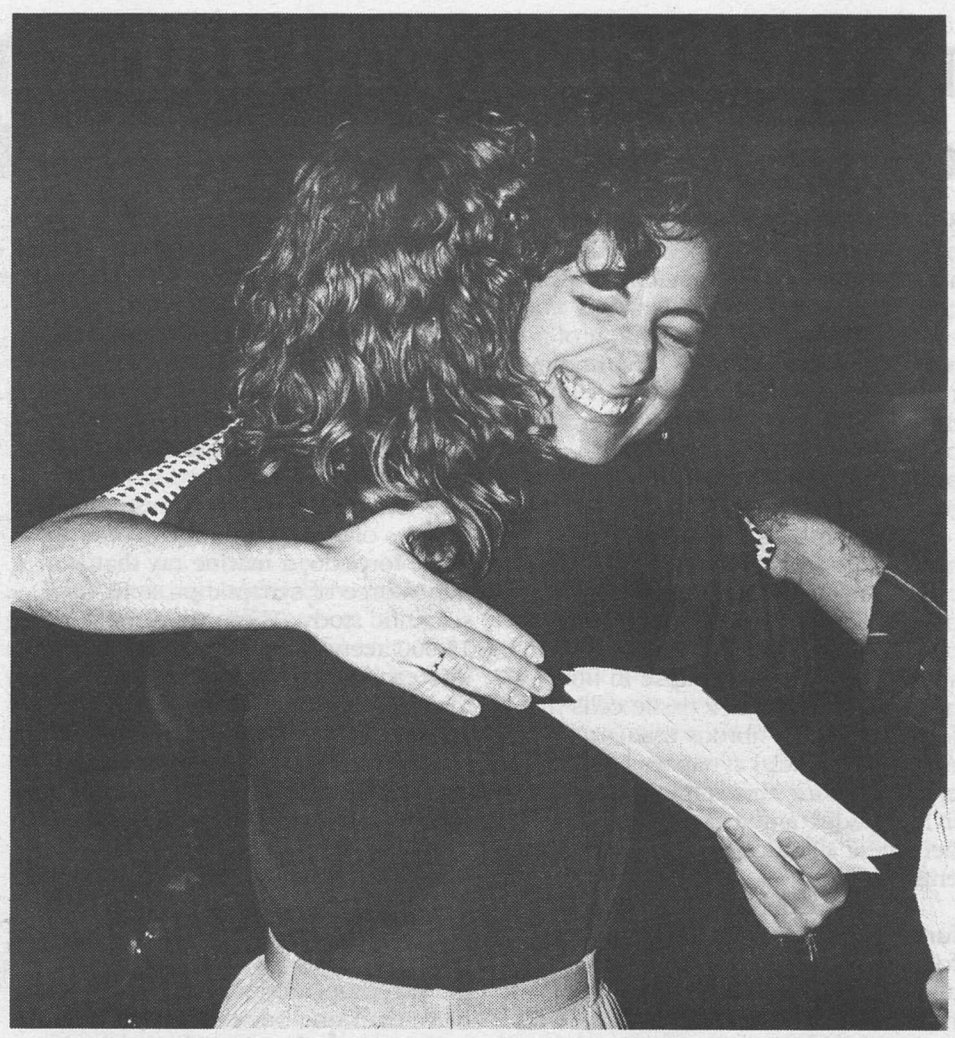
Currently 12 percent of the University's ACTU patients are black. However, in 1989 35 percent of all Missourians who tested positive for HIV, the virus that causes AIDS, were black, and researchers say there is a need to increase their access to drug studies.

Patients now being seen at the Regional clinic are about evenly split between black and white.

All research costs, including experimental drugs and related tests, are provided free of charge. Routine care provided by the Infectious Disease Clinic is billed as normal. In addition to primary care and clinical trials, the AIDS satellite facility provides individual case management coordinated by a social worker.

The satellite facility was made possible by a $244,400 grant jointly funded by the National Institute of Allergy and Infectious Diseases and the National Institute of Drug Abuse. It is a supplement to the existing AIDS Clinical Trials grant with Gerald Medoff, M.D., and Lee Ratner, M.D., Ph.D., as co-principal investigators.

For information, call 879-6410.



Match Day: Angela De Michele is jubilant after hearing the news of her residency match. She will spend her first-year appointment in obstetrics and gynecology at the hospital of the University of Pennsylvania in Philadelphia. Seventy percent of the graduating medical students matched with their first choice and 92 percent matched with one of their first three choices.

Pharmacology's leaders to give lecture

The three men who have led the School of Medicine's Department of Molecular Biology and Pharmacology over the last 44 years will gather May 16 to deliver the 14th Annual Oliver H. Lowry Lecture in Pharmacology.

Oliver H. Lowry, M.D., Ph.D., Philip Needleman, Ph.D., and Jeffrey I. Gordon, M.D., will discuss "Pharmacology: Generational Views and Thoughts." The lecture, open to all members of the medical and scientific community, will begin at 4 p.m. in the Carl V. Moore Auditorium.

Lowry, distinguished professor emeritus and lecturer, served as head of the pharmacology department from 1947-76 and served again as acting head from 1989-90. A member of the National Academy of Sciences, he is an internationally renowned histochemist whose techniques and approaches have had a profound effect on neurobiology, neurochemistry and biochemistry.

His research concentrates on the nervous system, with particular emphasis on the chemistry of various cell types in brain tumors. Recently, his lab developed a method to measure rapid changes in glucose consumption which is applicable to small numbers of cultured cells or small regions of the brain.

Needleman is corporate vice president of research and development and chief scientist of the Monsanto Company. Head of pharmacology at the School of Medicine from 1976-89, he maintains an appointment as research professor of molecular biology and pharmacology. He was elected into the National Academy of Sciences in 1987 and is recognized worldwide for his research on the mechanisms of blood pressure regulation.

His early studies on the pharmacology of organic nitrates had a major impact in the treatment of angina pectoris, the chest pain thought to be caused by an insufficient blood supply to the heart. He also has had a career-long interest in how peptides directly influence blood vessel dilation and kidney function to regulate blood pressure and blood volume.

Gordon was appointed chairman and alumni professor of the Department of Molecular Biology and Pharmacology last January. For the last eight years, he has studied a family of lipid-binding proteins and their genes, using a variety of methods.

His lab was the first to use transgenic, or genetically engineered, mice to study how the genes that produce these lipid-binding proteins are expressed in different intestinal cells and in different regions of the intestine. In other research, his team's work has led to the development of a new class of compounds that has inhibited replication of the AIDS virus in cultured human white blood cells.

The Lowry lecture is sponsored by the Department of Molecular Biology and Pharmacology to honor Lowry. For information, call 362-7053.

Perry receives hypertension award

H. Mitchell Perry Jr., M.D., professor of medicine, has been awarded the Edward D. Freis Award for excellence in basic, clinical or applied research in hypertension.

The award from the National High Blood Pressure Education Program was presented April 9 at the National Conference on Cholesterol and High Blood Pressure Control in Washington, D.C. A stipend of $1,000 accompanied the award.

Perry is director of the hypertension division and clinic at the School of Medicine and is a staff physician at Barnes Hospital. He also serves as director of the hypertension program at the St. Louis Veterans Administration Hospital and as physician coordinator for the VA's national hypertension program. His research in recent years has focused on problems with high blood pressure encountered by elderly people and minorities.

He is currently directing the St. Louis section of a 16-center national study called the Systolic Hypertension in the Elderly Program (SHEP). The study is designed to learn whether lowering systolic blood pressure with drugs will decrease heart attacks and strokes. It also investigates whether medication can favorably affect memory and mental powers in people aged 60 and older, and whether lowering systolic blood pressure improves the quality of their lives.

He also created and directed a St. Louis Heart Association project to help identify young, black males with uncontrolled hypertension who face potentially fatal medical problems. The program called for door-to-door canvassing of minority communities to locate and treat people with high blood pressure.

The award is named in honor of Freis, the physician responsible for a landmark study published in 1970 that showed treating patients with drugs for moderate hypertension decreased morbidity and mortality.

Berg and Schreiber are named alumni endowed professors

Two faculty members at the School of Medicine have been named alumni endowed professors.

Douglas E. Berg, Ph.D., is alumni professor in molecular microbiology and Robert D. Schreiber, Ph.D., is alumni professor in pathology. The appointments were announced by William A. Peck, M.D., vice chancellor for medical affairs at the University and dean of the School of Medicine.

"Douglas Berg and Robert Schreiber are world class leaders in their respective scientific fields, and are great contributors to Washington University," says Peck. "They richly deserve the honor of the alumni professorships. By the same token, we are most appreciative of the enormous effort by the alumni association in providing their truly unique support for the institution."

Supported with donations from alumni and former house staff, alumni professorships are designed to attract and retain faculty. The first professorship was established in 1982. The School of Medicine hopes to establish an alumni endowed professorship in each of its 17 departments; the Department of Pathology has the fourth.

Berg, professor of molecular microbiology and genetics, conducts research closely related to the nation's Human Genome Initiative. Washington University was one of four institutions in the nation designated last year as a Human Genome Center; the federally funded project's goal is to decipher the complete genetic message of human beings at the molecular level. Berg is studying transposable elements, the structure and evolution of genes and genomes, and the mechanisms by which bacterial organisms cause disease.

He is particularly interested in the development of transposons, or transposable elements — specific sequences of DNA which can insert in the chromosomes of a cell. He discovered a bacterial transposon called Tn5 and found it to be especially valuable as a research tool because it can be inserted into target DNA, used to identify genes, rearrange genomes and carry new DNA segments. He is developing Tn5 as a tool for efficient large scale DNA sequencing and analyses of gene function.

Schreiber is professor of pathology and molecular microbiology. Work in his laboratory focuses on understanding an important protein that regulates immune responses known as Interferon-gamma. Interferon-gamma belongs to a family of molecules known as cytokines, which are secreted by immunologically active cells and provide a mechanism by which different cells communicate with one another. One of Schreiber's goals is to determine how Interferon-gamma interacts with immunologically important cells by learning more about the role of the Interferon gamma receptor which must be present for binding and cellular response to occur. He is also investigating how Interferon-gamma is produced and whether faulty production can lead to autoimmune or immunodeficiency diseases.

The long-term goal of this work is to provide insights into the role of Interferon-gamma in regulating immune responses and ultimately to develop new therapies for treating autoimmune diseases.

Other School of Medicine faculty who have been named alumni endowed professors are Jeffrey I. Gordon, M.D., chairman of the Department of Molecular Biology and Pharmacology, and Alan L. Schwartz, M.D., Ph.D., professor of molecular biology and pharmacology and director of the division of hematology/oncology. The first alumni endowed professor was Philip Needleman, Ph.D., research professor and former chairman of the Department of Pharmacology, now vice president of corporate research at Monsanto.

MEDICAL RECORD

Protein will increase understanding of how nerves and muscles interact

Scientists at the School of Medicine have created the rudiments of an artificial synapse in connective tissue cells, enabling them to identify a protein that spurs the formation of neuromuscular junctions. The finding confirms researchers' suspicions about the role of the heretofore mysterious protein, called 43-kD, and may provide a new model for the study of neuromuscular diseases.

A synapse is the site at which nerve cells and muscle cells communicate. John P. Merlie, Ph.D., professor of molecular biology and pharmacology, and his colleagues have constructed the model synapse in fibroblast cells, connective tissue cells that form the body's fibrous tissues. Although artificial synapses have been created before, this is the first stable living model, and as such could become a significant tool for neuroscientists.

"This model will be helpful in further defining the proteins needed for synapse formation," Merlie says. "It also will increase understanding of how nerves and muscles interact with each other at the molecular level." This basic research eventually could advance treatment of neuromuscular diseases like muscular dystrophy or Parkinson's disease.

The work is described in the Feb. 1, 1991, issue of the journal Science. The paper details the group's efforts to discover more about the workings of the 43-kilodalton, or 43-kD, protein.

Scientists have recognized for some time that the 43-kD protein, normally concentrated under the postsynaptic membrane, has a close association with receptors for acetylcholine, one of the primary chemicals involved in the communication between nerve cells and muscle cells. A receptor is a protein, usually found on a cells surface, that is responsible for binding proteins like acetylcholine and relaying the information they contain to components within the cell. It is well known that acetylcholine receptors must cluster in the postsynaptic membrane in order for synapse formation to occur. However, this work shows for the first time that acetylcholine receptors are unable to cluster without the 43-kD protein.

For the study, Merlie and his colleagues placed adult and fetal acetylcholine receptors from mice into fibroblast cells. Then they introduced a cloned 43-kD protein and found that the acetylcholine receptors accumulated in large clusters on the surface of the postsynaptic membrane of the cell.

"This suggests that 43-kilodalton protein can induce acetylcholine receptor clustering," Merlie says. "It also suggests that there must be direct contact between acetylcholine receptors and the 43-kD protein for cluster induction to occur."

Going to the source

For more than 50 years, researchers have known that acetylcholine is one of the principal chemicals necessary for transmitting signals between nerve cells and muscle cells. Despite this knowledge, a detailed understanding of how acetylcholine works has eluded them.

Central to understanding acetylcholine's function is a knowledge of the structural components of the acetylcholine receptor. Merlie has examined various aspects of the acetylcholine receptor since his postdoctorate days at the Pasteur Institute in France in 1973, but his focus now is on defining the proteins that compose synapses.

Much is known about the actual lines of communication — the release of acetylcholine and its binding with the receptor — but relatively little is known about what goes on inside the cell membrane where acetylcholine receptors are firmly entrenched. This is the area that most interests Merlie and his colleagues.

One of the most promising sources of information for their work is the torpedo, a marine ray that is a rich source of synaptic proteins for scientific study. There are about 15,000 acetylcholine receptors packed into each square micron of the torpedo's electric organ, Merlie says.

"From what has been observed in rays, we know that the most densely clustered receptors are at the adult neuromuscular junction. It's about as dense as you can pack a protein of this size in a membrane," he explains.

Each muscle fiber is made up of hundreds of single myoblasts, muscle precursor cells. The synapse, where the receptors are located, occupies no more than one-one-thousandth of the surface area of such a fiber.

"How those receptors 'know' where they are supposed to go is somewhat of a mystery," Merlie comments. "One of the questions we're interested in is, 'Why does that patch of the surface have synaptic proteins and why does the rest of the surface not have any synaptic proteins?'"

Several theories have been advanced, but one of the most widely accepted is that muscle or nerve cells direct the migration of acetylcholine receptors to exactly the right spot. According to Merlie, some of the proteins travel long distances during the migration. "In fact, early in the development of a muscle fiber — before a synapse ever forms — some of the proteins that will eventually be found in synapses are found all over the cell surface."

A Series of Firsts

Over the years, Merlie and his colleagues have published a number of scientific papers detailing their findings. The group's most recent paper builds on research published in the Proceedings of the National Academy of Sciences in 1987, when the Washington University team cloned the first 43-kilodalton protein. The group also was the first to clone 5-laminen, another synaptic protein, and among the first to clone and study the five genes for the acetylcholine receptor itself.

Currently the group is trying to measure how quickly the receptors cluster when 43-kD protein is added, mainly as a means of confirming the protein's clustering function.

"One of the things that's plagued us is that receptors and 43-kD are so rare that they're hard to visualize unless they're clustered," Merlie says. "So it's possible that individual receptors are sitting in the membrane in a normal muscle already associated with a single 43-kD protein and we wouldn't be able to tell that."

The researchers also want to determine just how ubiquitous 43-kD protein is. It seems to be present in heart, kidney and some connective tissue at very low levels, Merlie reports, which suggests it may be involved in organizing other kinds of receptors in other kinds of tissues.

In the near future, he and his colleagues plan to extend their studies on the function of 43-kD protein during the formation of real synapses in real muscle. Using transgenic, or genetically altered, mice, they will delete the gene for 43-kD protein to see how such a deletion affects synapse development.

"This will give us a much better idea, because even though we have had good success in reconstituting some aspects of these cells in tissue culture, the only real synapses we know about are in vivo," Merlie comments. "If we really want to know what a protein does during the development of a synapse, it is going to have to be in a live animal."

Jim Keeley

Stacy Smith receives Hughes fellowship

Stacy Cheryl Smith, M.D., a postdoctoral researcher at the School of Medicine, has received a fellowship from the Howard Hughes Medical Institute. The awards are the first in a new international program of postdoctoral research fellowships for physicians.

Smith was among 33 physician/scientists nationwide to receive the award, which provides funds for training in research on basic biological processes and disease mechanisms. The three-year fellowships are awarded to physicians who have completed at least two years of postgraduate clinical training. They provide an annual stipend of $35,000 to $50,000, a research allowance of $15,000 and a $12,000 institutional allowance.

Smith is a postdoctoral fellow in cardiology at Barnes Hospital, part of the Washington University Medical Center. Working in the laboratory of Paul M. Allen, Ph.D., associate professor of pathology, Smith is trying to better understand how the immune system causes progressive destruction of the heart in certain individuals with acute myocarditis. Specifically, she is studying immune effector mechanisms that link acute myocarditis with chronic cardiomyopathy.

Smith received her medical degree from the University of Southern California School of Medicine in 1986. At USC, she was a member of Alpha Omega Alpha honor society and received the Lange Medical Publications Academic Merit Award. She completed a residency in internal medicine at Brigham and Women's Hospital, Harvard Medical School, Boston.

The Howard Hughes Medical Institute supports graduate and undergraduate science education through its grants program, with future program development planned for pre-college science education. Other graduate fellowship programs of the institute include predoctoral fellowships in biological sciences and research training fellowships for medical students.

Established in 1953, the institute employs scientists in the fields of cell biology, genetics, immunology, neuroscience and structural biology. Investigators conduct medical research in Howard Hughes Medical Institute laboratories at academic medical centers and universities throughout the United States.

Medical employees to receive T-shirts during centennial

In recognition of the School of Medicine's 100th birthday, Centennial T-shirts will be given away free April 30 - May 3 to the medical school's faculty, staff and students.

T-shirts will be distributed from 9 a.m. to 4 p.m. on the second floor walkway of the Clinical Sciences Research Building. To receive a T-shirt, employees need to present their School of Medicine ID cards. One T-shirt will be distributed per School of Medicine ID, so those picking up T-shirts for others need to bring those people's IDs.

Also in observance of the centennial and as a thank you to employees for their efforts, the School of Medicine has distributed coupons for free food items in the cafeterias of the School of Medicine and Barnes, Jewish and St. Louis Children's hospitals. The coupons can be redeemed on certain dates for free soda, soup, popcorn, fruit and cookies.

Commemorative posters have been displayed throughout the medical school to serve as a reminder that the school is celebrating 'a century of excellence.' Even the medical school postage meter machines serve as reminders, with many now dispensing centennial postage stamps.

The Centennial committee is headed by M. Kenton King, M.D., Danforth Professor of preventive medicine and former dean of the School of Medicine. Future centennial activities will be announced in upcoming issues of the Medical Record.

Diabetes bike-a-thon calling for cyclists to peddle May 4

Team Washington University wants you!

The only skills required are the ability to ride a bicycle and desire to peddle for a good cause — the American Diabetes Association (ADA). A team of 60 cyclists from the School of Medicine will participate in the ADA bike-a-thon May 4, but there's room for more.

The team, which numbered 30 last year, wants at least 75 participants in this year's event. Members hope to raise $10,000 — double the amount raised by the group last year. Persons with all levels of cycling experience are encouraged to take part. Faculty, students and staff on the Hilltop Campus also are invited to participate.

Those interested should meet at the Grafton, Ill., commuter parking lot at 9 a.m., the day of the event. Jerseys provided by Hoechst Pharmaceuticals and emblazoned with Team Washington University will be distributed to the first 75 people to arrive. The 21-mile course winds along the Great River Road, but cyclists are not confined to the course nor are they required to complete the course.

ADA volunteers will provide food, refreshments and repairs along the route. Sponsor forms are necessary and can be obtained by calling Jesse Lipnick at 993-2841 or Alan Permutt, M.D., at 362-8680.

PERSONNEL NEWS

With thanks: A complimentary lunch, a recognition ceremony, and a host of games and sports will be held May 20 for all non-academic employees. The 16th annual Chancellor's Staff Day will begin in Edison Theatre at 11 a.m. with the staff service awards and recognition ceremony, followed at noon by lunch, free to all staff with a ticket, in Bowles Plaza and the Mallinckrodt Center cafeteria. For more information about participating in the numerous games, sports and exhibits that will take place from 1 to 3:30 p.m., call 889-5990.

University increases contributions to health insurance

Effective July 1, 1991, Washington University's contributions toward the cost of health and dental insurance coverage for active full-time employees will increase to $150 per month. Active part-time employees working 50 percent time or more (but less than 100 percent) will receive $75 per month for health and dental coverage after one year of continuous service. The University's contribution for union employees will be in accordance with the union contract.

Mammography test will be available on Hilltop Campus

On May 8, the Mallinckrodt Institute of Radiology Mammography Mobile will be on the Hilltop Campus, providing mammography testing to women employees.

For the location and to schedule a time for your test, call 362-7111. The charge will be $50 and must be paid at the time of the test. You should check your individual health insurance coverage for possible reimbursement.

Changes to retirement annuity are announced

Effective July 1, 1991, you may choose to invest your contributions and the University contributions to your retirement plan in the Vanguard family of funds or the Teachers Insurance and Annuity Association (TIAA)/College Retirement Equities Fund (CREF). A second change is the option to receive your retirement accumulation in a lump-sum upon attaining age 55 AND after terminating employment with Washington University. Each of these changes and the new procedures are described in the following paragraphs.

The Vanguard option

Effective July 1, 1991, you may allocate contributions to the Basic Retirement Annuity to the Vanguard family of funds. See your retirement annuity mailing for particular options.

You may invest your contributions and the University contributions in either TIAA/CREF or Vanguard. One example of how you might allocate your investment is to allocate 100 percent of your salary reduction to Vanguard while allocating 100 percent of your University contribution to TIAA/CREF. However, you may not allocate 50 percent of the University allowance to Vanguard and 50 percent to TIAA/CREF or 50 percent of the salary reduction to each plan.

Transfers

The allocation of future contributions may be changed each month by completing the Allocation Change form included in your retirement annuity mailing. This form will direct your monthly contributions from your payroll checks to TIAA/CREF or Vanguard. Allocating the contributions to the various accounts within TIAA/CREF and Vanguard will be made in accordance with the allocations on file with each carrier (TIAA or Vanguard). Therefore, please complete the Retirement Annuity Payroll Authorization form, and return to the appropriate benefits office should you desire to change the future contributions to the different carriers.

Transfers of previous contributions among the CREF accounts and Vanguard accounts may be made by contacting TIAA/CREF (1-800-842-2733) or Vanguard (1-800-345-1172) directly and requesting asset transfer kits. Any changes in allocation among accounts within each carrier should also be directed to the above numbers.

Effective July 1, 1991, TIAA account balances also will be available for transfers to CREF or Vanguard. The minimum transfer amount is $10,000 or the entire account balance if it's less than $10,000. Transfers will take place over a 10-year period in substantially equal annual installments. Each installment will include principal and interest, plus dividends as declared each year by TIAA.

Cash settlement

Effective July 1, 1991, employees who are more than 55 years of age AND have separated from service (i.e. retirement, resignation, etc.) may receive a cash settlement under the basic retirement annuity without taking an annuity payout. Now participants may elect to receive cash or an annuity. Again, the cash option is available to those employees who are older than 55 and have separated from service.

Any amounts in CREF or Vanguard may be received in full in one payment. However, TIAA may be received only via a 10-year payout as discussed above under the "Transfers" section.

In order to receive the cash settlement at retirement, participants will be offered a counseling session with Kevin P. Nussbaum, director of benefits, to discuss the advantages and disadvantages of a cash settlement. Before the cash may be received, the participants will be asked to sign a waiver. Thus, any cash request must be initiated through the Hilltop benefits office.

Group Presentations

To help you understand these changes and new options, we have scheduled group presentations. They will be conducted at the following times and locations:

Hilltop Campus –
April 29, noon and 4 p.m.
April 30, 9 a.m., noon and 4 p.m.
Brown Hall Auditorium, Room 100

Medical Campus –
May 1, 9 a.m., noon and 3 p.m.
May 2, 9 a.m., noon and 3 p.m.
Medical School Library Conference Room, 6th Floor

The presentations will last approximately 45 minutes, with a 15-minute question-and-answer session.

Contributions

Participants in the basic retirement annuity may change their tax-deferred contribution as of July 1, 1991. All eligible employees who are not participating should consider enrolling at this time. You are eligible if you are: a faculty member carrying half the regular course load, or a staff member working 1,000 hours in a year.

Generally, your salary reduction (tax deferred) contributions are limited to the following amounts expressed as a percent of salary (net of any deferred compensation):

	General Limits	
	New Employees	All Others
Under Age 45	10.5%	14.4%
Age 45 - 49	9.5%	13.2%
Age 50 and older	7.0%	10.8%

Above amounts are subject to an overall dollar limit of $9,500 per year.

In certain cases individuals may be able to exceed these amounts. To determine the maximum amount you want to contribute, please request an individual calculation. The deadline for requesting a calculation is 5 p.m. April 30. There is no need to request a calculation if you desire to contribute only 5 percent of your salary.

The request for a calculation form is included in your annuity mailing.

Enrollment

The University generally requires you to contribute 5 percent of your salary in order to receive the University allowance. The University contributes according to the following schedule:

Age	Amount*
Under age 45	7.0%
Age 45-49	8.5%
Age 50 and older	11.5%

*The above contributions are subject to limitations imposed by the IRS regulations.

The required 5 percent contribution is waived or reduced if you make less than $30,000 AND have five years of continuous service with the University. However, you must enroll in order to receive the allowance. The following schedule details the employee contribution (as a percent of salary) required to receive the University allowance:

Annual Earnings	Required Contribution
Under $20,000	Waived
$20,000 but less than $22,500	1%
$22,500 but less than $25,000	2%
$25,000 but less than $27,500	3%
$27,500 but less than $30,000	4%
$30,000 and above	5%

Contributions for union employees are determined in accordance with the union contract.

Investment options

The past performance results of TIAA/CREF and Vanguard are detailed in your retirement annuity mailing. These amounts are based on past performance and in no way indicate or predict the future performance of these investments. The amounts are rounded to the nearest 100th of a percent. These amounts have not been audited or otherwise verified by the University.

All questions, change forms, applications and transfer forms should be directed to: **Hilltop Campus —** Sylvia Pedroley or Kevin Nussbaum, 889-5990, Box 1184; **Medical Campus —** Mary Walsh or Tricia Asbury, 362-4927 or 362-7204, Box 8002

All requests for calculations must be received in the payroll office no later than April 30. All change forms and enrollment forms must be received in the appropriate benefits office no later than 5 p.m. May 31.

Personnel News

Personnel News appears monthly in the Record and is prepared by Gloria W. White, vice chancellor for personnel and affirmative action officer, and other members of the Personnel Office. Personnel News is designed to keep Washington University employees and their families informed of the benefits and opportunities available at the University.

CALENDAR

April 25 – May 4

LECTURES

Thursday, April 25

Noon. Dept. of Genetics Seminar, "Transposons and the Reverse Genetics of E. *coli*," Doug Berg, prof., WU Dept. of Molecular Microbiology. Room 816 McDonnell Medical Sciences Bldg.

2-5 p.m. Dept. of Anthropology Presents A Symposium on Human Ecology and Environment, featuring public presentations and open discussion. Issues include sustainable development policies; loss of species habitat and diversity; and relationships between human population and food resources. Professors in anthropology, ecology and political science from across the country will participate in the symposium. May Aud., Simon Hall. For more info., call 889-5252.

2:30 p.m. Dept. of Mechanical Engineering Seminar, "Survey of Skin-friction Measurement Technology," Raimo J. Hakkinen, prof., WU Dept. of Mechanical Engineering. Room 100 Cupples II.

4 p.m. Asian Studies Colloquium Series, "A Medieval Feminist Critique of the Chinese World Order: The Case of Wu Zetian." Stephen R. Bokenkamp, prof., Dept. of East Asian Languages and Cultures, Indiana U. Room 30 January Hall.

Friday, April 26

9:15-10:30 a.m. Pediatric Grand Rounds, "Sources, Effects and Clinical Management of Childhood Lead Poisoning," Joseph H. Graziano, prof. of pharmacology (in pediatrics), Columbia U. College of Physicians and Surgeons. Clopton Aud., 4950 Audubon Ave.

Noon. WU Centennial Seminars on Genome Studies and of Public Affairs, "Population Variation in Human Genetic Disease: The Example of Finland," Albert de la Chapelle, Dept. of Medical Genetics, U. of Helsinki-Finland. Room 816 McDonnell Bldg.

Noon. Dept. of Cell Biology and Physiology Seminar Series, "Calcium Homeostasis in Duchenne Muscular Dystrophy," Richard Steinhardt, Dept. of Molecular and Cell Biology, U. of Calif.-Berkeley. Erlanger Aud., Room 423 McDonnell Medical Sciences Bldg.

4 p.m. Dept. of Biology Seminar, "Vibrio Cholerae Produces a Toxin Which Affects Tight Junctions," James Kaper, Dept. of Infectious Diseases and Tropical Pediatrics, U. of Maryland. Room 322 Rebstock Hall.

4:30 p.m. Divisional Virology Seminar, "The HIV Protease: Role in Processing and Cytoxicity," Ron Swanstrom, Dept. of Biochemistry, U. of North Carolina. Erlanger Aud., McDonnell Medical Sciences Bldg.

Monday, April 29

Noon. Dept. of Molecular Biology and Pharmacology Seminar, "Rostrocaudal Gradient of Gene Expression in Adult Skeletal Muscle," Joshua R. Sanes, assoc. prof., WU Dept. of Anatomy and Neurobiology. Pharmacology Library, 3912 South Bldg.

Noon. Molecular Biology Program Thesis Defense, "Regulated Synthesis, Phosphorylation and Functional Expression of Sinbis Virus RNA Replication/Transcription Machinery," Guangpu Li, WU graduate student, Dept. of Molecular Microbiology. Room 775 McDonnell Medical Sciences Bldg.

1 p.m. Molecular Biology: Genetics and Biochemistry Program Thesis Defense, "Structure and Regulation of a Cluster of Hematopoietic Serine Protease Genes," Robin D. Hanson, WU graduate student, Dept. of Internal Medicine. 8842 Clinical Sciences Research Bldg.

2 p.m. Dept. of Chemical Engineering Seminar, "Surface Reactivity and Catalysis: Oxidation and Deoxygenation on MO (110) and Rh (111) Surfaces," Cynthia M. Friend, prof. of chemistry, Harvard U. Room 100 Cupples II. For more info., call 889-6063.

4 p.m. Dept. of Biology Seminar, "The Eubacterial Inheritance of Eucharyotic Cells: Genomes, Genes and Introns," Jeffrey Palmer, Indiana U. Room 322 Rebstock Hall.

4 p.m. Immunology Seminar Series, "CD4+ CTL: A Killer by Any Other Name Would Be Just as Deadly," Vivian Braciale, asst. prof., WU Dept. of Pathology. Third Floor Aud., Children's Hospital, 400 S. Kingshighway Blvd.

4 p.m. Dept. of Psychology Colloquium, "An Integrative Theory of Leadership," Martin Chemers, Claremont McKenna College. Room 102 Eads Hall. For more info., call 889-6565.

Tuesday, April 30

Noon. Alzheimer's Disease Research Center Seminar, "The Disruption of Neuronal Polarity in Alzheimer's Disease," Kenneth Kosik, Dept. of Neurology, Harvard Medical School. Room 928 McDonnell Medical Sciences Bldg.

4 p.m. Dept. of Earth and Planetary Sciences Colloquium, "Magmatic and Hydrothermal Processes in Layered Intrusions," Craig Schiffries, Congressional Science Fellow, U.S. Senate; Carnegie Institute, Geophysical Laboratories. Room 102 Wilson Hall. For more info., call 889-5610.

4 p.m. Divisional Colloquium in Cell and Molecular Biology, "Local Chemical Changes Underlying White Cell Chemotaxis," Fred Fay, Program of Molecular Medicine, U. of Massachusetts Medical School. Cori Aud., 660 S. Euclid Ave.

Wednesday, May 1

10 a.m. Cell Biology Program Thesis Defense, "Cloning and Characterization of the Murine B-Globin Locus Control Region," Ann M. Moon, WU graduate student, Dept. of Internal Medicine. 8842 Clincial Sciences Research Bldg.

12:30 p.m. Neuroscience Luncheon Seminar, "What's New in Confocal Microscopy?" Jeff Lichtman, assoc. prof., WU Dept. of Anatomy and Neurobiology. Room 928 McDonnell Medical Sciences Bldg.

4 p.m. Divisional Plant Biology Seminar, "Controlling Elements Governing Thytochrome Gene Repression in Cereals," Wesley Bruce, Northern Illinois U. Room 309 Rebstock Hall.

4 p.m. Biochemistry and Molecular Biophysics Seminar, "How Cooperative Enzymes Work: The Energetics of Allosteric Regulation in E. *coli* Asparate Transcarbamylase," Norma Allewell, Molecular Biology and Biochemistry Dept., Wesleyan U. Erlanger Aud., McDonnell Medical Sciences Bldg.

Thursday, May 2

Noon. Dept. of Genetics Seminar, "Molecular Genetics of the Kinesin Superfamily in Drosophila," Larry Goldstein, Dept. of Biology, Harvard U. Room 816 McDonnell Medical Sciences Bldg.

Noon. Dept. of Molecular Biology and Pharmacology, "Role of Low Molecular Weight GTP Binding Proteins in Signal Transduction," Eduardo Lapetina, Division of Cell Biology, Burroughs Wellcome Co. 3912 South Bldg.

4 p.m. Dept. of Earth and Planetary Sciences Presents the Carl Tolman Colloquium, "Mid Proterozic Anorogenic Plutonic Perforation of North America," J. Lawford Anderson, prof., Dept. of Geological Sciences, U. of Southern Carolina. Room 102 Wilson Hall. For more info., call 889-6510.

4 p.m. WU Centennial Seminars on Genome Studies and Public Affairs, "We Mean Well: The Phenylketonuria Story," Charles Scriver, Dept. of Medical Genetics, McGill U. Cori Aud., 660 S. Euclid Ave.

Friday, May 3

8 a.m. Division of Medical Genetics, Dept. of Pediatrics and Center for Genetics in Medicine Seminar, "The Cystic Fibrosis Carrier Screening Pilot Study," Charles Scriver, Dept. of Medical Genetics, McGill U. Third Floor Aud., Children's Hospital, 400 S. Kingshighway Blvd.

Noon. Cell Biology and Physiology Seminar, "Proton Secretion to Dissolve Bone Mineral," Paul Schlesinger, WU Dept. of Cell Biology and Physiology. Room 423 McDonnell Medical Sciences Bldg.

6 and 8:30 p.m. WU Association Travel Lecture Series Presents "Passport to Poland," James Cole, film lecturer. Graham Chapel. For ticket info., call 889-5212.

MUSIC

Thursday, April 25

8 p.m. Dept. of Music Presents a Gala Concert with Olly Wilson, composer and prof., University of Calif.-Berkeley. Wilson is a WU alumnus. Sheldon Concert Hall, 3648 Washington Ave. For more info., call 889-5581.

Friday, April 26

8 p.m. Dept. of Music Presents an Opera Double Bill featuring "Trouble in Tahiti" and "Sopranos Only." (Also April 27, same time.) St. Louis Conservatory and Schools for the Arts, 560 Trinity Ave. Cost: $20. Proceeds will benefit women's shelters. For more info., call 889-5581.

Sunday, April 28

3 p.m. Dept. of Music Presents The Bach Festival with WU Chamber Choir. Third Baptist Church, 620 N. Grand. Cost: $8. For more info., call 889-5581.

3 p.m. Dept. of Music Presents a Piano Recital with Bee-Yin Soo, WU alumnus. Steinberg Hall Aud. Free. For more info., call 889-5581.

7:30 p.m. Dept. of Music Presents a University City Symphony Orchestra Concert. Graham Chapel. Free. For more info., call 994-1760.

Monday, April 29

8 p.m. Dept. of Music Presents Small Chamber Ensembles and Flute Choir Concert. Gallery of Art, Steinberg Hall. Free. For more info., call 889-5581.

8 p.m. Dept. of Music Presents Electronic Music Concert, directed by Richard O'Donnell. Tietjens Rehearsal Hall. Free. For more info., call 889-5581.

Tuesday, April 30

8 p.m. Dept. of Music Presents a Mixed Choir Concert, directed by Janet Krupnik. Graham Chapel. Free. For more info., call 889-5581.

Thursday, May 2

8 p.m. Dept. of Music Presents a Senior Piano Recital with Alison Brownstein. Graham Chapel. Free. For more info., call 889-5581.

Saturday, May 4

8 p.m. WU Opera Class Presents Scenes From "Carmen," "Die Fledermaus," and "La Cenerentola." (Also May 5, same times.) Women's Bldg. Lounge. Free. For more info., call 889-5581.

PERFORMANCES

Friday, April 26

8 p.m. Edison Theatre "OVATIONS!" Series Presents the Lar Lubovitch Dance Company. (Also April 27, same time.) The all-Mozart program recognizes the bicentennial of the composer's death. Edison Theatre. Cost: $18 for general public; $14 for senior citizens and WU faculty and staff; and $9 for students. For ticket info., call 889-6543.

8 p.m. Performing Arts Dept. Presents Ayckbourn's "Woman in Mind." (Also April 27 at 8 p.m., and April 28 at 2 p.m.) Mallinckrodt Center Drama Studio, Room 208. **All shows are sold out.** For more info., call 889-6543.

Sunday, April 28

2 p.m. Edison Theatre "ovations! for young people" Presents the Lar Lubovitch Dance Company. The company will give young audiences a behind-the-scenes look at how a modern dance work is created. Edison Theatre. Cost: $7. For ticket info., call 889-6543.

Friday, May 3

8 p.m. Edison Theatre "OVATIONS!" Series Presents The Pickle Family Circus in "Luna Sea." (Also May 4 at 2 and 8 p.m., and May 5 at 2 p.m.) Edison Theatre. Cost: $18 for general public, $14 for senior citizens and WU faculty and staff; and $9 for students. For ticket info., call 889-6543.

EXHIBITIONS

"Roman Republican Coins." Through May 19. Gallery of Art, lower gallery, Steinberg Hall. Gallery hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. For more info., call 889-4523.

"Washington University Art Collections." Through May. Gallery of Art, lower gallery, Steinberg Hall. Gallery hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends.

"MFA II Exhibition." April 27-May 5. Opening reception from 5 to 7 p.m. April 26. Gallery of Art, upper gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays, 1-5 p.m. weekends.

"Winning Collections of the Neureuther Student Book Collection Competition." Through May 10. Special Collections, Olin Library, Level 5. Exhibit hours: 8:30 a.m.-5 p.m. weekdays.

"Mozart Bicentennial Exhibit." The exhibit marks the 200th anniversary of the death of Wolfgang Amadeus Mozart. On loan from the Austrian Cultural Institute of New York, the exhibit will be on display through May 8. Exhibit hours: 8:30 a.m.-5 p.m. weekdays.

"Core Exhibition." May 3-19. Bixby Gallery, Bixby Hall. Exhibit hours: 10 a.m.-4 p.m. weekdays; 1-5 p.m. weekends.

FILMS

Friday, April 26

7 and 9:30 p.m. Filmboard Feature Series Presents "The Naked Gun." (Also April 27, same times, and April 28 at 7 p.m.) Room 100 Brown Hall. $3.

Midnight. Filmboard Midnight Series Presents "Rock and Roll High School." (Also April 27, same time, and April 28 at 9:30 p.m.) Room 100 Brown Hall. $3. On Fri. and Sat., both the 9:30 p.m. and midnight films can be seen for a double feature price of $4; both Sunday films can be seen for $4.

SPORTS

Friday, April 26

3 p.m. Baseball. WU vs. Harris-Stowe State College. Kelly Field.

Saturday, April 27

10 a.m. Men and Women's Outdoor Track and Field. WU Invitational. Bushyhead Track.

Sunday, April 28

2 p.m. Baseball. WU vs. McKendree College. Kelly Field.

Friday, May 3

3 p.m. Men and Women's Outdoor Track and Field. WU Qualifying Meet. Bushyhead Track.

MISCELLANY

Friday, April 26

1 p.m. Phi Delta Theta/ALS Memorial Golf Tournament. Norwood Hills Country Club near Lucas and Hunt Road. Registration begins at 10 a.m. Fee: $150. Proceeds to benefit the ALS (Amyotrophic Lateral Sclerosis — Lou Gehrig's Disease) Association of Greater St. Louis. For more info., call Derek Schwartz at 721-6721.

Sunday, April 28

4:30 p.m. Wesley Fellowship Presents the Annual 'Last Lecture,' "Onward," Curtis Thies, WU professor of chemical engineering. Women's Bldg. Lounge. For info., call 385-3000.

Friday, May 3

9 a.m. Center for the Study of Islamic Societies and Civilizations Presents "New Approaches in the Study of Islamic Literatures," an international workshop. (Also May 4.) Alumni House, 6510 Wallace Circle. For more info., call 889-5166.

Saturday, May 4

9:30 a.m.-1:30 p.m. WU's Alzheimers' Disease Research Center Presents "Ethical Issues in Dementia," a continuing education credit conference. Panel will discuss whether the Alzheimer's patient should be told the diagnosis, when the right to drive should be taken away, and how decisions are made to withhold treatment. Cost: $10 for students; $20 for general registration; and $50 for professional (physician, nurse, social worker, attorney or general). Registration must be postmarked by April 29 to: Ethics Conference, St. Louis Alzheimer's Association, 9374 Olive Street Road, St. Louis, MO 63132. Simon Hall. For more info., call 432-3422.

Calendar Deadline

The deadline to submit items for the May 2-11 calendar of the Record is April 26. Items must be typed and state time, date, place, nature of event, sponsor and admission cost. Incomplete items will not be printed. If available, include speaker's name and identification and the title of the event; also include your name and telephone number. Send items to Deborah Parker, calendar editor, Box 1070, or by electronic mail to p72245DP at WUVMC.

Opera double bill to benefit shelters

The Department of Music will sponsor an opera double bill at 8 p.m. April 26 and 27 at the St. Louis Conservatory and Schools for the Arts, 560 Trinity Ave., in University City. All proceeds will benefit St. Louis shelters for battered women.

The two operas are Leonard Bernstein's "Trouble in Tahiti," which deals with a failing marriage, and "Sopranos Only," by Tom Johnson, a spoof of operatic conventions. The operas are the first to be performed by Washington University students in 10 years.

Tickets are $20. For tickets or for more information, call 889-5581.